VES NO1 2672

Suomi

JAPAN METEOROLOGICAL AGENCY

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In reply, please address
DIRECTOR-GENERAL
JAPAN METEOROLOGICAL AGENCY

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Dr. David S. Johnson
Director
National Environment Satellite Service/NOAA
Federal Office Building 4
Washington, D.C. 20233
U.S.A.

Dear Sir,

Recognizing the effectiveness of the Geostationary Meteorological Satellite (GMS) launched in the last July and considering the significance of maintaining such satellite observing system, JMA had been requesting to the relating government agencies the authorization of the follow-on program to GMS, the GMS-2 program. The Space Activities Commission (SAC), responsible for the planning and coordinating the Japanese space activities, decided development and launch of GMS-2 in the revised Space Development Program. The program provides that GMS-2 shall fundamentally have the same function and performance as GMS, and it shall be launched in fiscal 1981 from Tanegashima Space Center in Japan aboard an N-II Launch Vehicle having the launch capability corresponding to Delta 1914 to 2914 under development in Japan, while GMS was launched under the launch service of NASA.

The National Space Development Agency of Japan (NASDA), a Japanese space agency corresponding to NASA in the United States, is responsible for development and launch of GMS-2 and N-II Launch Vehicle. Nippon Electric Company (NEC) has been selected for the contractor of GMS-2 development as in the case of GMS, and Hughes Aircraft Company will be the sub-contractor of NEC. The total cost required for the spacecraft development including manufacturing of PFM and FM is estimated to be approximately 15 billions of yen (U.S. $60 million) of which 4.3 billions of yen ($17 million) was already appropriated by the National Diet as a part of fiscal 1977 budget. The remainder was authorized by the finance authorities and submitted to the Diet for appropriation as fiscal 1978 budget.

SAC is working for the establishment of mid-term Japanese space plan providing space activities during the coming 15 years. JMA has so far requested to SAC to include in the plan a) operationalization of GMS/GMS-2, b) grading-up of GMS/GMS-2 (development and operationalization of GMS-3 with vertical sounding function), and c) development of further graded-up spacecraft of three-axis-stabilized type with more expanded vertical sounding capability and more effective observation performance in higher resolution. JMA is also studying the future plan of geostationary meteorological satellite, and at the present stage has a concept described in the attachment. We intend to complete the study by this May. The grade-up of the future satellite in our concept is aimed at performing improvement of large scale weather forecasts through acquisition and exchange of global meteorological data as directed in the GARP/WWW Program and also of forecasts of smaller weather phenomena through numerical handling of meso-scale phenomena. And we believe that our concept would meet the concept of the United States as seen in the GOES-D, E and F, SSOS, and SEOS program and concept. It is the JMA's intention to make the planning based upon the world-wide trend and requirement which will be known through the study of the program of the United States and European Space Agency, since the observation data by such meteorological satellite system should be globally compatible from the requirement of world-wide exchange of such data which will be inevitable for the improvement of meteorological services.

In this context, I would be very much grateful if you could provide us with your future plan (not necessarily be an established and authorized one but any of the conceptual stage will be helpful for our study).

Also attached is the result of a trial estimate of economical benefit of Japanese meteorological services made by JMA. We are requested to make a further study because development and maintenance of meteorological satellite observation system needs large amount of expenses. It would also be very much obliged if you could provide me with the result of your study in this field, if any.

Thank you very much in advance for your cooperation.

Very truly yours,

Y. Sekiguchi

Yoshiro Sekiguchi
Head
Planning Division

Inclosure.

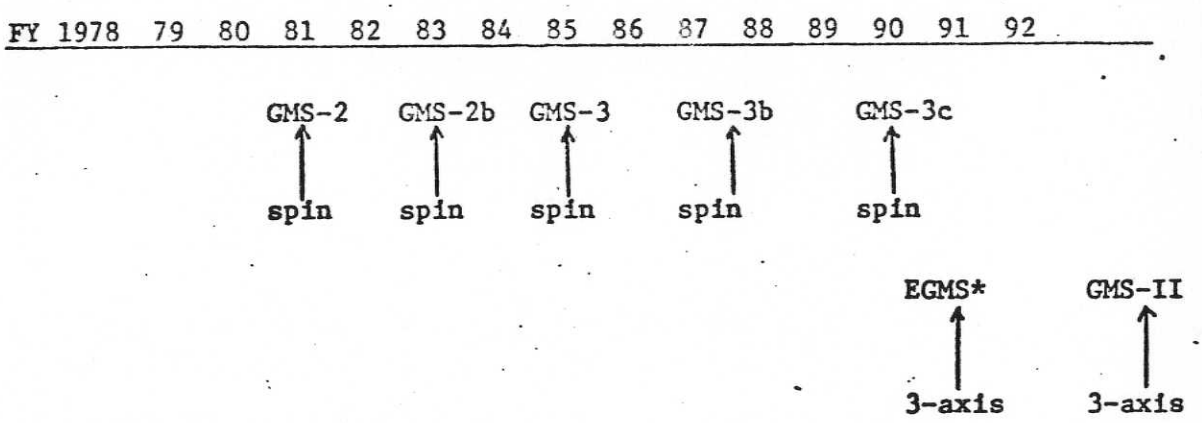
ATTACHMENT I

15-year Meteorological Satellite Program Concept

1. Target of Meteorological Satellite Activities

- Operationalization of GMS/GMS-2 series satellites
- Expansion of observation items of GMS/GMS-2; development and operationalization of spin-stabilized satellites with vertical sounding capability of temperature and water vapor profile
- Development of three-axis-stabilized satellites; for improvement of observation efficiency of sounding and imaging and improvement of resolution
- Utilization of lower orbiting earth observation satellites such as Landsat, Seasat and other Japanese earth sounding satellites

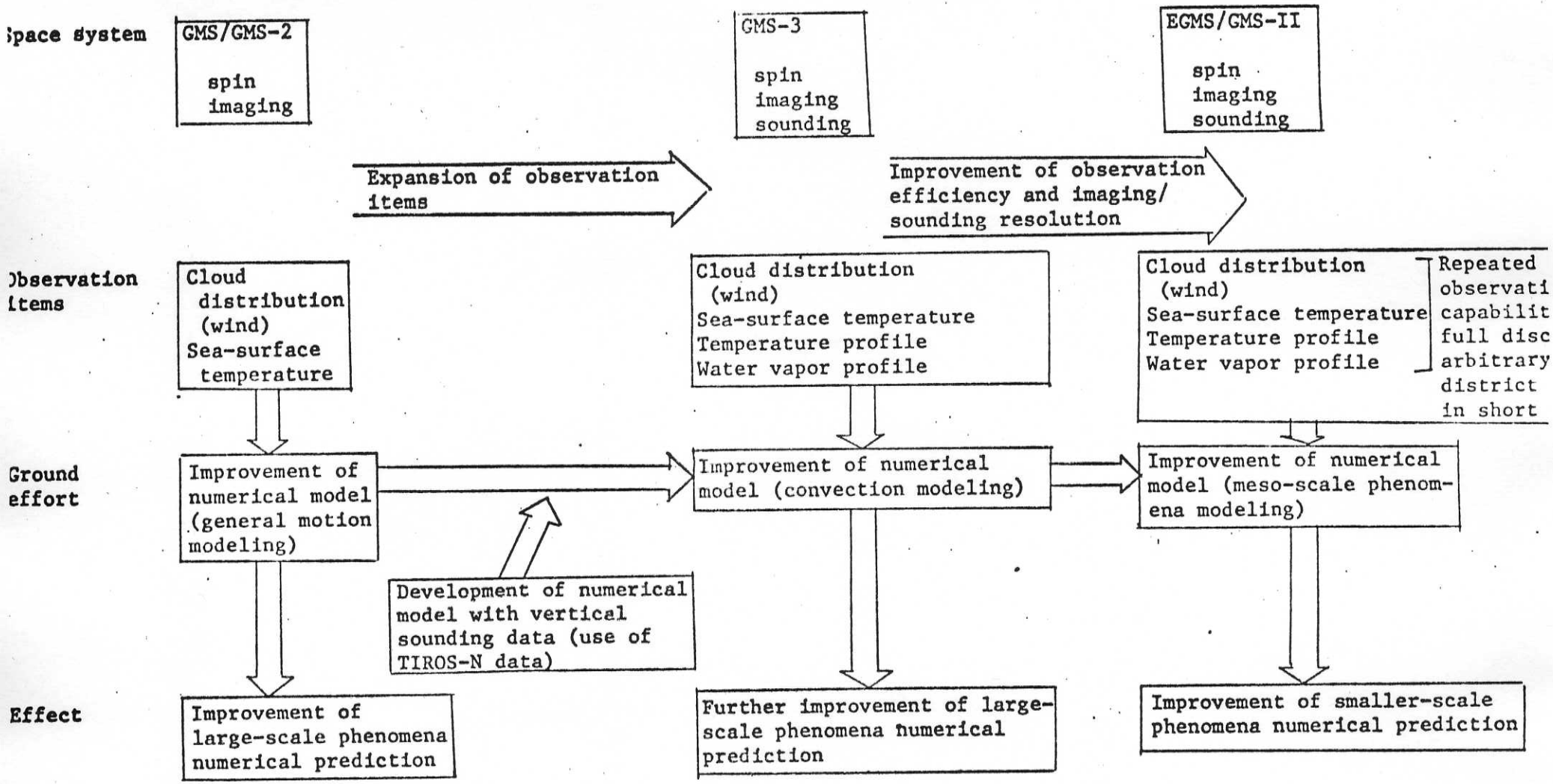
2. Program Plan Concept



Launch frequency will be determined so that later-launched spacecraft becomes the operational and the previous one becomes the orbital spare to the operational one.

*: Experimental GMS for new satellite demonstration

3. Improvement of Meteorological Services by use of Geostationary Meteorological Satellite Data



4, Future Satellite Concept

Satellite	Weight/ stabiliza- tion	Launch vehicle	On-board equipment	Mission	Observation performance			
					Imaging		Sounding	
					res.		res.	
GMS-3	350kg spin	N-II	VISSR with vertical sounder DCS SEM	Vis/IR imaging Vertical sounding of temp and water vapor profile Collection of weather data Dissemination of weather data Observation of solar particles	Vis:1.25km IR: 5.0 km	25 min. for full disc, 5 min. for partial scan of 1/5 disc	Temp: 50km 6 layers Vapor:100km 3 layers	13h for full disc (30 min. for 5° latitude)
EGMS/ GMS-II	700kg 3-axis	H-1	Sounding and imaging radiometer DCS SEM	do	Vis:0.5 km IR: 2 km	20 min. for full disc, 2 min. for arbitral part (500 km square)	Temp: 10km 8 layers Vapor: 10 km 4 layers	2h for full disc (5 min for 5° latitude)

Spacecraft weight is that of at the station acquisition not including AKM propellant and including AKM case.

ATTACHMENT II

Trial Estimation of Benefit of Japanese Meteorological Services and Meteorological Satellite Programs

It is very difficult to make quantitative estimate of economical benefit of weather services, however, some meteorological authorities made the estimate at the request of WMO based upon the resolution of 20th Executive Committee.* The following estimate was made employing the same methods employed by those countries. The result was; the total benefit of meteorological services would be some 990 billions of yen per annum of which meteorological satellite contribution would be of about 30 percent or around 300 billions of yen when the meteorological satellites were in operational phase.

year

Field	Benefit	Estimation of benefit value	Benefit amount per annum (in billions of ye
Fishery	Improved security of operation and increased catch amount by better operation management	2-3% of catch amount (1701**)	43
Agriculture	Better planning and operation, and production increase by prevention from damages due to severe weather conditions	1% of production (7777**)	78
Forestry	Prevention from forest fires	1/4 of loss by forest fires (1.6**)	0.4
Construction	Better planning and scheduling, and better engineering design	0.5-5% of investment (33122**)	662
Air transport	Economical planning of flight routes	3% of costs for long-distance flights (172**)	5
Land transport			
-Railways	Better operation and security	0.1% of revenue (1600**)	2
-Road traffic	Accidents prevention	0.15 of amount paid to settle accident claims	0.5
Shipping	Improved security and shipping route choice	5% of revenue (995**)	50
Production of power	Better planning of production	0.075% of production amount (3507**)	3
Weather disaster prevention	Protection from harmful weather phenomena	20-30% of damages (743**)	149
		Total	992

Note: 1 U.S. $ = 250 yen approx.

*: World Weather Watch Planning Report No. 27 "The Economic Benefit of National Meteorological Services", WMO

**: in billions of yen, as of 1974